



Second Semester MCA Degree Examination, June/July 2025
Machine Learning & Data Analytics using Python

Date Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
 2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define Machine Learning. Describe its types with examples.	10	L2	CO1
	b.	Illustrate the data visualization using matplotlib with three different charts.	10	L3	CO1
OR					
Q.2	a.	Demonstrate the use of NumPy and Pandas for reading a csv file and manipulate the data with appropriate examples.	10	L3	CO1
	b.	Explain the steps involved in Data Preprocessing. Mention the techniques used for handling missing values and outliers.	10	L2	CO1
Module – 2					
Q.3	a.	Explain Linear and Polynomial Regression. Provide code examples using sklearn.	10	L2	CO2
	b.	Describe model evaluation metrics like MAE, MSE, and RMSE.	5	L2	CO2
	c.	Write a short note on overfitting and underfitting with visual explanation.	5	L2	CO2
OR					
Q.4	a.	Describe the working of K-Nearest Neighbors (KNN) algorithm. Write code for classification using KNN.	10	L2	CO2
	b.	List and explain any four classification algorithms and their use cases.	10	L2	CO2
Module – 3					
Q.5	a.	Discuss K-Means clustering algorithm and its implementation in Python.	10	L2	CO3
	b.	Illustrate Principal Component Analysis (PCA) and its use in dimensionality reduction.	10	L3	CO3

OR

Q.6	a.	Develop a Python program to perform Hierarchical clustering and visualize using a dendrogram.	10	L3	CO3
	b.	Explain Apriori algorithm and its use in market basket analysis.	10	L2	CO3

Module – 4

Q.7	a.	Differentiate Bagging and Boosting with suitable examples.	6	L2	CO4
	b.	Describe the XGBoost algorithm and provide a working Python example.	8	L2	CO4
	c.	Define Support Vector Machine. Explain kernel trick with a diagram.	6	L2	CO4

OR

Q.8	a.	What are CNNs? Discuss their architecture and applications.	10	L2	CO4
	b.	Write a Python code to build and train a simple neural network using Keras.	10	L2	CO4

Module – 5

Q.9	a.	Explain steps in Exploratory Data Analysis (EDA) with examples.	10	L2	CO5
	b.	Describe the ARIMA model and its use in time series forecasting.	10	L2	CO5

OR

Q.10	a.	With an example, explain building a web application with Django for ML model integration.	10	L2	CO5
	b.	Explain model deployment using Flask. Provide a deployment flow diagram.	10	L2	CO5
